# More Land But Fewer Farms Dedicated to Fruit Production in 1997

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**Abstract:** There were more acres devoted to the production of fruit and tree nuts in the United States in 1997 than 10 years earlier. The number of farms, however, declined. Farms became bigger and the plantings more dense. While most farms with acreage devoted to fruit or tree nut commodities are still predominantly small, most of the production and revenue came from the few largest farms. Despite the trend towards fewer, larger farms, most farms are still family or individually operated. Farming as a primary occupation was heavily skewed towards older farmers.

**Keywords:** Fruit, tree nuts, berries, production, acreage, farms, distribution, commodity.

As the United States continue to consume more fruit, tree nuts, and berries and international demand for these products continues to grow, more land has been dedicated to the growing of these commodities. In 1987 there were 4.7 million acres producing fruit and nuts domestically. By 1997, the amount grew to 5.3 million acres. The number of farms producing these commodities, however, declined 11 percent during this period. In 1987, there were 138,057 farms producing berries and tree fruit and nuts—by 1997, there were 122,892 farms. Many factors contributed to the restructuring of the industries toward fewer but larger farms. Larger farms could meet the changing economy of scales occurring during the 10 years resulting from higher land values; costlier labor, especially in relation to competitive producers around the world; increased cost of production geared to meet specific requirements of other countries; high costs of mechanization for some crops; and consolidation of production to regions in the United States that have comparative advantage for growing conditions.

California had by far the greatest number of farms and acres planted to fruit and nuts. By 1997, California accounted for 37 percent of the farms and 50 percent of all acreage. While the number of farms declined over the 10-year period, California's share of farms grew relative to other States. Other major producing States include Florida, with 19 percent of the acreage and 9 percent of the farms; Washington, with 6 percent of the acreage and 5 percent of the farms; and Georgia, with 3 percent of both the acreage and farms (table A-1). California, Florida, and Washington had among the largest increases in acreage between 1987 and 1997. Both California and Florida experienced smaller declines in number of farms than most States, with each registering a 6-percent decline. Larger declines occurred in States that traditionally produced for the processing market, such as Michigan, Illinois, Pennsylvania, and Wisconsin. Although still relatively small, States such as Wyoming, Nebraska, and North Dakota had big increases in the number of acres and farms producing fruit and tree nuts, as new enterprises may have been established as alternatives to other commodities.

About 80 percent of all tree fruit and nut acreage was irrigated in 1997, compared with 74 percent in 1987. Western States were more likely to rely on irrigation than most of the rest of the Nation. In California, Arizona, and New Mexico, production often took place on arid soil, and irrigation was necessary to maintain the trees. In Washington, 97 percent of farms and acreage is irrigated. Only half of Oregon's trees are irrigated. Most other States rely on precipitation. These growers have fewer options during drought years and often production can fall dramatically. Irrigation in Florida increased 8 percent between 1987 and 1997 to 91 percent of fruit acreage. During this period, Florida experienced two freezes that forced its citrus industry to move further South. The area where growers began planting required irrigation so that fresh water would feed the groves rather than the underground water that was too salient. In response to the devastating effects of the freezes, growers also wanted irrigation as a means of frost control. Irrigation can be used during a freeze to provide protection to the fruit by providing an ice coating that keeps the fruit warmer than the outside temperature. The water spray also helps keep the groves warmer than the air above, reducing freeze damage to trees.

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Table A-1--Total number of farms with land in orchards or vineyards, by State, 1987-97

| State | Total farms | | | Share of U.S |
|---|---|---|---|---|
| | 1987 | 1992 | 1997 | 1997 |
| | --Number-- | | | Percent |
| Alabama | 2,536 | 2,309 | 1,874 | 1.77 |
| Alaska | | 2 | 4 | .00 |
| Arizona | 1,141 | 1,162 | 843 | .79 |
| Arkansas | 1,017 | 762 | 646 | .61 |
| California | 41,021 | 40,298 | 38,747 | 36.53 |
| Colorado | 838 | 840 | 761 | .72 |
| Connecticut | 308 | 332 | 253 | .24 |
| Delaware | 36 | 25 | 31 | .03 |
| Florida | 9,965 | 10,258 | 9,379 | 8.84 |
| Georgia | 4,137 | 4,146 | 3,541 | 3.34 |
| Hawaii | 2,128 | 2,537 | 2,786 | 2.63 |
| Idaho | 482 | 472 | 377 | .36 |
| Illinois | 955 | 882 | 734 | .69 |
| Indiana | 770 | 755 | 571 | .54 |
| Iowa | 508 | 481 | 448 | .42 |
| Kansas | 503 | 448 | 406 | .38 |
| Kentucky | 1,020 | 982 | 715 | .67 |
| Louisiana | 1,065 | 1,019 | 821 | .77 |
| Maine | 394 | 396 | 334 | .31 |
| Maryland | 617 | 517 | 422 | .40 |
| Massachusetts | 572 | 525 | 431 | .41 |
| Michigan | 3,791 | 3,531 | 2,863 | 2.70 |
| Minnesota | 448 | 509 | 533 | .50 |
| Mississippi | 1,326 | 1,196 | 902 | .85 |
| Missouri | 1,127 | 886 | 1,004 | .95 |
| Montana | 317 | 296 | 261 | .25 |
| Nebraska | 139 | 142 | 143 | .13 |
| Nevada | 78 | 68 | 68 | .06 |
| New Hampshire | 219 | 242 | 219 | .21 |
| New Jersey | 746 | 701 | 577 | .54 |
| New Mexico | 1,526 | 1,885 | 1,744 | 1.64 |
| New York | 3,290 | 2,938 | 2,436 | 2.30 |
| North Carolina | 1,749 | 1,522 | 1,213 | 1.14 |
| North Dakota | 30 | 36 | 40 | .04 |
| Ohio | 1,873 | 1,717 | 1,395 | 1.32 |
| Oklahoma | 2,351 | 2,112 | 2,733 | 2.58 |
| Oregon | 4,410 | 4,200 | 3,869 | 3.65 |
| Pennsylvania | 2,805 | 2,317 | 2,069 | 1.95 |
| Rhode Island | 83 | 72 | 54 | .05 |
| South Carolina | 1,134 | 1,157 | 885 | .83 |
| South Dakota | 64 | 40 | 52 | .05 |
| Tennessee | 1,346 | 1,182 | 1,043 | .98 |
| Texas | 10,524 | 9,995 | 8,804 | 8.30 |
| Utah | 865 | 790 | 631 | .59 |
| Vermont | 221 | 258 | 228 | .21 |
| Virginia | 1,463 | 1,387 | 1,080 | 1.02 |
| Washington | 6,839 | 6,220 | 5,700 | 5.37 |
| West Virginia | 646 | 558 | 530 | .50 |
| Wisconsin | 993 | 1,079 | 853 | .80 |
| Wyoming | 18 | 23 | 16 | .02 |
| United States | 120,434 | 116,207 | 106,069 | 100.00 |

Source: Bureau of the Census, Census of Agriculture, various years.

## *Number of Farms Declined for Leading Crops But Increased for Minor Crops*

There were more farms growing apples in the eighties and nineties than any other fruit or tree nut (table A-2). While apple farms remained the most popular in 1997, the number of farms producing apples declined 24 percent between 1987 and 1997, continuing the decline that was occurring in the eighties. Still, there were almost one and a half times more farms producing apples than grapes, the commodity with the next largest number of farms. Grape farms ranked second throughout the eighties and nineties. The number of grape farms fell 14 percent between 1987 and 1997, with the decline speeding up slightly during the second half of this period. The other crops with the greatest number of farms in 1997 included pecans, peaches, oranges, pears, strawberries, walnuts, plums, and sweet cherries.

The commodities with the fewest number of farms included wild blueberries, limes, cranberries, hazelnuts (filberts), pistachio nuts, and tangerines. Many of these minor crops, however, experienced the greatest growth between 1982 and 1997. The crops with the fastest increase in farms were pistachios, blueberries, cranberries, tangerines, and wild blueberries. All of these crops are grown in limited areas that, in the past, limited the number of farms. Pistachio farms, predominantly located in California, increased as a result of decreased competition from Iran, the world's largest pistachio producer. In 1986, countervailing and antidumping duties of about 300 percent were placed on Iranian pistachios by the U.S. Government. A U.S. embargo on Iranian pistachios followed shortly after. Both measures provided domestic growers more price security due to the reduced competition, and production expanded. The embargo has recently been lifted for Iranian pistachio nuts, causing concern for American pistachio growers. The high duties, however, still remain in effect and they make Iranian pistachios too costly to effectively compete in the U.S. market. Should the duties also be removed in the near future, the growth in pistachio production in the United States could be expected to slow. Iranian pistachios are less expensive than those produced in the United States and will likely force down grower prices for domestically-grown pistachios. U.S. pistachios, however, are said to be of higher quality than the Iranian nuts and that will likely stabilize demand for the U.S. product in the domestic and international markets.

Farms growing cranberries, wild blueberries, and cultivated blueberries, found mostly in the Northeast and Midwest, increased due to increased consumer demand. Scientific studies found beneficial chemicals in these berries, such as cranberries reducing urinary tract infections, blueberries having anti-aging properties, as well as the high levels of antioxidants in both that are said to reduce the risks of heart disease and cancer. As a result of the publicity surrounding the research, demand for these berries increased. The number of blueberry farms, both cultivated and wild (mostly in

Table A-2--Number of fruit and nut farms and acres, 1987 and 1997

| Commodity | Number of farms | | Percent change | Share of total farms | Number of acres 1/ | | Percent change | Share of total acres |
|---|---|---|---|---|---|---|---|---|
| | 1987 | 1997 | 1987-97 | 1997 | 1987 | 1997 | 1987-97 | 1997 |
| | --Number-- | | --Percent-- | | --Number-- | | --Percent-- | |
| Noncitrus | 132,749 | 106,921 | -19.5 | 87.0 | 2,268,859 | 2,356,057 | 3.8 | 44.1 |
| Apples | 36,718 | 28,100 | -23.5 | 22.9 | 601,021 | 570,320 | -5.1 | 10.7 |
| Apricots | 3,306 | 3,033 | -8.3 | 2.5 | 23,960 | 25,776 | 7.6 | 0.5 |
| Avocados | 6,902 | 6,089 | -11.8 | 5.0 | 87,700 | 77,144 | -12.0 | 1.4 |
| Bananas | 563 | 822 | 46.0 | 0.7 | 1,742 | -- | -- | -- |
| Sweet cherries | 7,171 | 6,387 | -10.9 | 5.2 | 60,462 | 69,609 | 15.1 | 1.3 |
| Tart cherries | 4,198 | 2,805 | -33.2 | 2.3 | 68,390 | 50,569 | -26.1 | 0.9 |
| Cherries, not specified | 1,720 | 893 | -48.1 | 0.7 | 2,211 | 471 | -78.7 | -- |
| Coffee | 754 | 1,057 | 40.2 | 0.9 | 2,391 | 8,020 | 235.4 | 0.2 |
| Dates | 190 | 177 | -6.8 | 0.1 | 6,800 | 6,611 | -2.8 | 0.1 |
| Figs | 647 | 847 | 30.9 | 0.7 | 16,630 | 20,301 | 22.1 | 0.4 |
| Grapes | 23,236 | 19,961 | -14.1 | 16.2 | 833,293 | 1,004,545 | 20.6 | 18.8 |
| Guava | 159 | 299 | 88.1 | 0.2 | 1,168 | 1,326 | 13.5 | -- |
| Kiwifruit | 1,015 | 559 | -44.9 | 0.5 | 9,020 | 6,037 | -33.1 | 0.1 |
| Mangoes | 379 | 391 | 3.2 | 0.3 | -- | 2,071 | -- | -- |
| Nectarines | 2,341 | 2,124 | -9.3 | 1.7 | 33,470 | 43,937 | 31.3 | 0.8 |
| Olives | 1,363 | 1,317 | -3.4 | 1.1 | 33,264 | 37,714 | 13.4 | 0.7 |
| Papayas | 396 | 556 | 40.4 | 0.5 | 3,905 | 4,217 | 8.0 | 0.1 |
| Passion fruit | 41 | 83 | 102.4 | 0.1 | 65 | -- | -- | -- |
| Peaches | 20,995 | 14,459 | -31.1 | 11.8 | 239,698 | 180,223 | -24.8 | 3.4 |
| Pears | 10,092 | 8,062 | -20.1 | 6.6 | 84,247 | 77,917 | -7.5 | 1.5 |
| Persimmons | 965 | 1,280 | 32.6 | 1.0 | 2,627 | 4,184 | 59.3 | 0.1 |
| Plums/prunes | 8,789 | 6,585 | -25.1 | 5.4 | 151,183 | 155,625 | 2.9 | 2.9 |
| Pomegranates | 337 | 342 | 1.5 | 0.3 | 3,477 | 4,242 | 22.0 | 0.1 |
| Other noncitrus | 472 | 693 | 46.8 | 0.6 | 2,135 | 5,198 | 143.5 | 0.1 |
| Citrus: | 17,796 | 17,105 | -3.9 | 13.9 | 1,084,504 | 1,345,352 | 24.1 | 25.2 |
| Grapefruit | 4,998 | 4,445 | -11.1 | 3.6 | 189,416 | 200,577 | 5.9 | 3.8 |
| Kumquats | 62 | 67 | 8.1 | 0.1 | 99 | -- | -- | -- |
| Lemons | 1,915 | 2,108 | 10.1 | 1.7 | 68,837 | 75,610 | 9.8 | 1.4 |
| Limes | 985 | 861 | -12.6 | 0.7 | -- | 4,137 | -- | 0.1 |
| Oranges | 14,312 | 13,468 | -5.9 | 11.0 | 791,248 | 998,157 | 26.1 | 18.7 |
| Tangelos | 757 | 1,001 | 32.2 | 0.8 | 13,004 | 21,103 | 62.3 | 0.4 |
| Honey tangerines | 149 | 242 | 62.4 | 0.2 | -- | -- | -- | -- |
| Other tangerines | 853 | 1,613 | 89.1 | 1.3 | 11,004 | 31,861 | 189.5 | 0.6 |
| Other citrus | 167 | 493 | 195.2 | 0.4 | 270 | 3,669 | 1,258.9 | 0.1 |
| Tree nuts | 41,469 | 38,659 | -6.8 | 31.5 | 1,202,521 | 1,453,380 | 20.9 | 27.2 |
| Almonds | 6,749 | 6,045 | -10.4 | 4.9 | 427,705 | 540,276 | 26.3 | 10.1 |
| Filberts (hazelnuts) | 1,345 | 1,112 | -17.3 | 0.9 | 28,745 | 32,721 | 13.8 | 0.6 |
| Macadamia nuts | 1,258 | 1,391 | 10.6 | 1.1 | 23,857 | 20,908 | -12.4 | 0.4 |
| Pecans | 21,431 | 19,923 | -7.0 | 16.2 | 453,243 | 519,054 | 14.5 | 9.7 |
| Pistachios | 830 | 1,140 | 37.3 | 0.9 | 51,959 | 94,893 | 82.6 | 1.8 |
| English walnuts | 8,154 | 6,850 | -16.0 | 5.6 | 213,628 | 235,175 | 10.1 | 4.4 |
| Other nuts | 479 | 764 | 59.5 | 0.6 | 1,402 | 5,059 | 260.8 | 0.1 |
| Other fruit and nuts | 1,223 | 1,434 | 17.3 | 1.2 | 1,982 | 5,294 | 167.1 | 0.1 |
| Berries | 18,077 | 16,823 | -6.9 | 13.7 | 171,999 | 185,869 | 8.1 | 3.5 |
| Blackberries | 2,086 | 2,396 | 14.9 | 1.9 | 6,679 | 7,611 | 14.0 | 0.1 |
| Blueberries | 3,911 | 5,159 | 31.9 | 4.2 | 37,247 | 45,000 | 20.8 | 0.8 |
| Wild blueberries | 501 | 671 | 33.9 | 0.5 | 21,969 | 24,679 | 12.3 | 0.5 |
| Boysenberries | 350 | 348 | -0.6 | 0.3 | 1,198 | 1,552 | 29.5 | 0.0 |
| Cranberries | 912 | 1,059 | 16.1 | 0.9 | 26,983 | 35,250 | 30.6 | 0.7 |
| Currants | 43 | 61 | 41.9 | 0.0 | 335 | 219 | -34.6 | -- |
| Loganberries | 84 | 45 | -46.4 | 0.0 | 240 | -- | | |
| Raspberries | 4,297 | 3,957 | -7.9 | 3.2 | 15,484 | 17,328 | 11.9 | 0.3 |
| Strawberries | 9,398 | 7,141 | -24.0 | 5.8 | 53,085 | 53,477 | 0.7 | 1.0 |
| Other berries | 93 | 197 | 111.8 | 0.2 | 205 | -- | -- | -- |
| Total 2/ | 138,511 | 122,892 | -11.3 | | 4,732,162 | 5,343,933 | 12.9 | |

-- = Not available.

1/ Acres are planted acres for tree fruit, nuts, and vines, but harvested acres for berries. 2/ Total in orchards, vineyards, and berry plants.

Source: Census of Agriculture, various years.

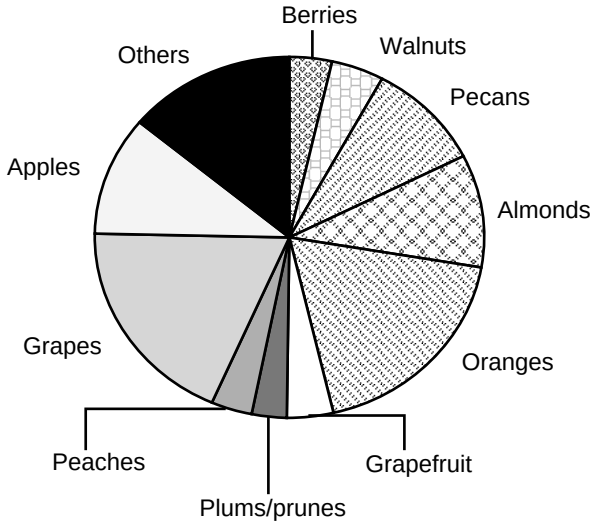
Maine) are expected to increase in the coming years. The scientific studies on blueberries are recent, and the industry has only begun to respond to higher consumer awareness of these products. Cranberry farms, however, are expected to decline in the future because of a glut of cranberries in the market recently that has greatly reduced grower prices.

Tangerine farms, found mostly in Florida and to a much lesser extent in California and Arizona, have grown in numbers in the eighties and nineties, as the citrus industry responded to consumer desire for easier to peel citrus. Florida growers were also responding to the higher prices they could receive from tangerines than to other fresh citrus fruit. Trying to tap into the surging demand for imported clementines, both Florida and California are trying to grow clementines or other seedless easy peeler varieties of tangerines. The number of farms growing tangerines is expected to increase, especially if a seedless variety that would grow successfully in either State is found.

### *Acreage Increased for Most Tree Fruit and Nuts*

The greatest number of acres planted to fruit and nuts in 1997 was for grapes and oranges. These two commodities have consistently had the greatest acreage, followed by apples, almonds, and pecans (fig. A-1). Peaches had the next greatest number of acres in 1982 but declined 25 percent by 1997. The greatest reduction occurred between 1992 and 1997. Harsh weather conditions in the major Southern States, bringing both droughts and freezing temperatures during the nineties, forced growers in South Carolina and Alabama to reduce their acreage. Growers in many other

Figure A-1
**Share of total fruit and nut acreage, by commodity, 1997**




Source: National Agricultural Statistics Service, USDA.

States found it hard to compete with California's peach industry that ship peaches throughout the country at the same time as local peaches are available. The number of peach acres decreased in California as well. However, the number of peach trees in California increased during this period. New trees planted closer together than was previously the practice, contributed to decreased acreage.

Tart cherry acreage experienced a similar decline, from 68,390 acres in 1987 to 50,569 acres in 1997. Michigan, which accounted for 78 percent of tart cherry production in 1997, lost 17 percent of its acreage and 14 percent of its trees between 1992 and 1997. Despite the reduced acreage and number of trees, production rose from the eighties to the end of the nineties. A marketing order for tart cherries started in 1997 and may bring some stability to an otherwise erratic market and in turn may slow future declines in tart cherry acreage.

Lime acreage has been greatly affected by weather conditions. In the fall of 1992, a hurricane hit southern Florida, the predominant area for lime production in the United States, and destroyed many of the trees. Not all the acres were replanted. As a result, there were 38 percent more acres in the 1987 Census than the 1997 Census (due to timing, the 1992 Census was not able to capture the loss from Hurricane Andrew). Lime acreage is unlikely to recover to levels of the early eighties because the State lime industry has recently been plagued by citrus canker, requiring large portions of infected groves to be destroyed. Many of these trees were just beginning to come into full production after they had been replanted from the hurricane, and growers were not yet making a profit off of much of their acreage before they again lost trees to another natural disaster. Since many growers already were debt laden from the first disaster, and because the U.S. lime industry has strong competition from Mexico, many growers are unlikely to replant once again. Many growers will likely look towards other commodities which might be less risky to grow.

Apple acreage slid by 5 percent between 1987 and 1997. Almost all States reported acreage losses. The number of acres and farms declined throughout the East and Midwest as the industry moved westward. The increased dominance of Western apples in the domestic market make it difficult for many of the older orchards elsewhere to compete, shifting production West. Acreage increased in both Washington and California. Washington, the largest apple producer, reported a 26-percent increase in apple acreage, with most of the growth occurring in the nineties. The majority of farms growing apples in Washington are still small, 78 percent of the farms had less than 50 acres planted to apples. Half the acreage and production came from farms with 50 to 499.9 acres. While the number of farms and acreage in this category grew substantially between 1992 and 1997, the greatest increase came from farms in the 1,000 acre and over category. The number of farms in Washington with at

least 1,000 acres increased 80 percent from 1992 to 1997. Although these farms comprise only a small portion of Washington's apple industry, 15 percent of the apple acreage was located on these farms. They also contributed an increased proportion of production in 1997 relative to 1992, accounting for 18 percent of production. According to the Census, 18 farms comprised this category. Tree plantings on new acreage is very dense, said to range from 600 to 900 trees per acre. New dwarf tree varieties allow for closer planting and easier harvesting. As a result, the yield per acre is increasing. While apple producers in the East and Midwest may be converting replanted acreage to new dwarf trees, established orchards generally consist of older trees, planted further apart. More acreage in Washington and California, however, are planted with the dwarf varieties. While Washington accounted for 36 percent of apple acreage in the United States in 1997, the high tree density resulted in the State having 51 percent of the apple trees and 50 percent of the production.

Citrus acreage (excluding limes) increased between 1987 and 1997. Growers in Florida quickly replaced trees lost as a result of freezes in 1988 and 1989. Not only did they plant more acres than in 1987, but they also planted the new trees more densely. Although California continued to have a greater planting density in its orange groves at an average of 117 trees per acre in 1997, Florida's orange tree density increased 25 percent, to 114 trees per acre. The density, however, is greater in the new groves than in older plantings. Orange acreage increased in all the producing States, Florida, California, Arizona, Texas, Louisiana, and Hawaii. Most of the States grow oranges for the fresh market. Florida, however, grows predominantly for the juice market. Florida had the largest concentration of large farms. About 4 percent of farms growing oranges in Florida had 500 acres or more; in California 3 percent of the farms had at least 500 acres. In Florida, 2 percent of the farms had over 1,000 acres. These farms accounted for 59 percent of the orange trees and 59 percent of production in 1997. Similar information was not available for California for 1997. California farms with at least 250 acres, however, accounted for 40 percent of all acres and 45 percent of 1997's orange production. This is less than 1992 when farms with 250 or more acres accounted for 67 percent of production. In Florida and California, however, the greatest majority of farms had less than 50 acres planted to oranges. Eighty-two percent of Florida's groves and 86 percent of California's groves fell into this category in 1987, declining to 76 percent for Florida and 84 percent for California in 1997. Farms in this category accounted for 11 percent of Florida's production and 29 percent of California's production in 1987 and 7 percent and 20 percent in 1997.

Growers have increased production of fresh oranges both by increasing the acres planted and the tree density per acre. The impetus for this is greater demand, both domestically and internationally. Between 1987 and 1997, domestic per capita consumption of fresh oranges increased 14 percent, exports increased 13 percent. Increased demand helped raise the value of California's fresh orange crop by 27 percent from the late eighties to the late nineties. Florida's increased acreage also reflects increased overall consumption. Domestic demand for orange juice increased 3 percent between 1987 and 1997, with the domestic market accounting for 73 percent of total supply in 1997. Exports, while still small compared with other commodities, grew 94 percent.

As production of not-from-concentrate orange juice (NFC) continues to grow in popularity, demand for Florida oranges will also increase. As consumers move towards purchases of NFC, which relies totally on Florida-produced oranges, and away from frozen concentrated orange juice, which may include imported juice, demand for Florida oranges should continue to increase. Florida's production, however, has yet to reach its peak levels. Trees planted after the freezes were only beginning to produce at near full capacity when adverse weather conditions in Florida reduced crop size for about 2 years in a row. While 1997/98 was a record crop, there is potential for equal to or even larger crops with the present plantings, under good weather conditions. With the growing importance of NFC, however, acreage could continue to grow in order to meet demand. Florida growers, however, also face environmental factors that could put pressure on further acreage growth. Tight water supplies and the reclamation of the Everglades will likely affect expansion in southern Florida. Rapid urbanization throughout the State and growing intolerance by the nonfarm sector to some agricultural practices are factors affecting acreage expansion throughout most of the lower half of the State. With these factors put together, Florida's orange production may be expected to see some increases in the future, but not at the same rate as in the late eighties and early- to mid-nineties.

Grapefruit acreage also increased in Florida between 1987 and 1997, mostly in response to strong prices in the late eighties and early nineties. Prices, however, began to decline with the 1992/93 season, and growers began to have difficulties meeting their costs of production. Large juice stocks in the subsequent years kept demand for processing grapefruit (which accounted for 58 percent of total grapefruit utilization) down. As a result, 6 million boxes of grapefruit were abandoned in 1996/97 for economic reasons. Another 6 million boxes were abandoned in the following year. In the grapefruit industry, like the rest of the tree fruit and nut industry, there is a lag of several years between the receipt of lower prices and growers' response. Because of the nature of fruit production, the large investment required in a grove, and the number of years before a commercial crop is produced, growers are likely to maintain groves for several years in spite of low prices in the hope of a market turn around. Therefore, although prices began declining in 1992/93, growers did not respond by decreasing acreage or the number of trees until about 1998. The Florida Agricultural Statistics Service conducted a special grapefruit

survey in 1999 and discovered that acreage declined between 1997 and 1999. Growers were removing trees to decrease production and hopefully boost prices. Demand for grapefruit appeared to be improving in 1999/2000, mostly due to small beginning juice stocks. There also appears to be a growing consumer interest in not-from-concentrate grapefruit juice. As a result, prices improved during the marketing year. Stagnant domestic consumer demand, however, for fresh grapefruit, will likely prevent growers from replanting groves to grapefruit anytime in the near future.

Grape acreage increased almost 21 percent between 1987 and 1997. Much of the increase occurred in the nineties and was centered in the major wine-producing States—California, Washington, and Oregon. New York, however, lost about 10 percent of its grape acreage, mostly in the late eighties and early nineties. Most farms still have less than 25 acres planted to grapes. These farms decreased only slightly between 1987 and 1997, from 73 percent to 70 percent of all farms growing grapes. In 1997, there were 598 farms with 500 acres or more of grapes (2 percent of the total) while 124 farms had 1,000 or more acres. This is up from 486 farms with 500 or more acres and 85 with 1,000 or more in 1987. The increase in acreage came partly as a response to increased demand for domestic wines. In California, which accounts for about 90 percent of U.S. grape production, acreage increases were greatest in the mid-nineties for wine-variety grapes, followed by fresh-use varieties. Washington and Oregon have also been increasing their grape production for wine. By 1997, Washington replaced New York as having the second greatest amount of grape acreage, although both are far behind California, which accounted for 86 percent of all acreage in 1997.

The acres harvested for the major berries, such as strawberries, blueberries (cultivated and wild), cranberries, and raspberries increased between 1987 and 1997. Blueberries are grown commercially in just about every State, and the average sized blueberry farm in the United States decreased slightly in 1997, except in Michigan and New Jersey, the two largest producers. Throughout much of the rest of the country, the increase in acres came mostly from an increase in the number of farms growing blueberries and less from larger sized farms. In New Jersey, which accounted for 16 percent of the acres, both the number of farms and acres planted declined over the 10-year period. Farms with blueberries in other States increased their average acres from 31 to 35 acres. Michigan, the largest producer, accounting for 37 percent of acreage, had a decline in the number of farms, but an increase in the total acreage. The average blueberry farm grew from 19 acres in 1987 to 27 acres in 1997. In both of these States, farms appear to have been consolidated to produce on a more national level and to meet the stringent criteria demanded for export. The value of production for both fresh and processed blueberries has risen since 1997, which will likely result in new acreage entering blueberry production in the near future.

The wild blueberry industry experienced a slower increase in harvested acres than in the number of farms. Farms growing wild blueberries in Maine, which accounted for 96 percent of wild blueberry acres in 1997, decreased in size of acres planted to blueberries from 49 acres per farm in 1987 to 42 acres in 1997. Wild blueberry production, however, grew 117 percent over the 10 years, with most of the increase coming from new farms bringing in new acres rather than established farms increasing in size.

Cranberry production grew rapidly in the nineties. Increased demand for cranberry juice brought higher prices to growers, encouraging expansion in the industry. Massachusetts, traditionally known for cranberry production, remained the leader in cranberry farms. While harvested acreage also increased in the State, Wisconsin's production grew even more rapidly and now produces more than Massachusetts on slightly more land with less than half the number of farms. As a result, Wisconsin's cranberry farms averaged 66 acres in 1997 compared with 25 acres in Massachusetts. Both States had larger farms than 10 years earlier.

Raspberry acres harvested increased slightly over the decade while farms decreased. Washington has the most acres in raspberries, and accounted for 60 percent of production in 1997. It also had the largest farms, more than doubling in size between 1987 and 1997. Washington produces mostly red raspberries that are used for processing. With the number of harvested acres growing throughout the eighties and nineties, red raspberry production more than doubled over the 10-year period. Mostly as a result of the larger crop, the value of utilized production in 1997 was about double that of 10 years earlier. Grower prices averaged lower during 1996-98 than during 1986-88. Prices for red raspberries, however, tend to be erratic, and there is no real trend. Oregon ranked second for red raspberry acres, but its farms averaged about half the size of Washington's, not changing much from what they were 10 years before. Acreage had expanded in the late eighties and early nineties, but shows a steady decline since 1996. Along with the decline in acreage came a decline in the value of utilized production.

On a national level, strawberry harvested acres grew fractionally between 1987 and 1997. However, in the two major producing States, California and Florida, acres harvested grew rapidly over this period. California accounted for 52 percent of strawberry acreage by 1997, with most of the growth occurring throughout the eighties. Florida's growth occurred mostly in the nineties, but the number of farms increased mostly during 1987 to 1992. In California, farms growing strawberries averaged 83 percent larger in 1997 than 10 years earlier. The average farm growing strawberries in California had 37 acres in 1997, Florida's farms averaged 27 acres, 48 percent more than in 1987. California and Florida supply strawberries on a national level, complementing each other with their production. Florida's production begins in the winter months and fazes out as California's

crop hits the market around February. In the spring and early summer months, most strawberries are marketed locally from the remainder of the farms located throughout the country.

Farm size for most of the nut crops (almonds, pecans, hazelnuts, and walnuts) increased, with fewer farms from 1987 to 1997. Only pistachio nuts increased in both size and number of farms. California is the major producer of all tree nut crops, except for pecans and hazelnuts. Pistachio acreage increased most rapidly because of the reduction in domestic competition with the world's leading producer, Iran. The average sized farm in the State increased from 68 acres in 1987 to 90 acres in 1997. Arizona's acreage also increased during this period. Pistachio acreage grew steadily throughout the eighties and nineties. While minor compared with California, Arizona's acreage increased 84 percent, with an average farm having 43 acres.

Almonds accounted for the greatest number of tree nut acres. While the number of almond farms declined 10 percent between 1987 and 1997, the number of acres grew 26 percent, with most of the growth occurring between 1992 and 1997. Farms averaged about 90 acres of almonds by 1997. International demand for U.S. almonds drove most of the grower response to increase the number of acres and trees. California produces virtually all the almonds in the United States, and almonds are its second highest valued agricultural export. In 1997, almond exports were valued at $818 million, second in California only to cotton, and more than twice the value of third place, wine.

Pecan, hazelnut, and walnut acreage all rose, despite a decline in the number of farms. Pecan production is the most geographically dispersed of the commercial tree nuts. Texas and Georgia accounted for 56 percent of acreage in 1997. While acreage dedicated to pecan production increased in both States, it increased more rapidly in Oklahoma and New Mexico, the States with the next largest pecan acreage. The average-sized pecan farm was 26 acres in 1997, with Georgia and Oklahoma farms averaging higher, but Texas and New Mexico farms about average or slightly smaller. Arizona's average of 64 acres was the largest among all the States. Pecan acreage declined in Arizona between 1987 and 1997, but at a slower rate than the number of farms.

Hazelnuts are grown in Oregon and Washington at a distant second. The number of hazelnut acres declined between 1992 and 1997 after increasing between 1987 and 1992. The average size farm in Oregon grew from 23 acres in 1987 to 33 acres in 1997. Hazelnut consumption in the United States is the lowest among tree nuts. Limited domestic production result in high prices, making hazelnuts the most expensive of the major domestically grown tree nuts (*Agricultural Outlook*, Jan-Feb. 2000). The high price of hazelnuts in the domestic market, along with strong competition in the world market from lower priced Turkish hazelnuts, as well as other domestic nuts, likely led to the decline in acres in the nineties.

The average walnut farm size from 1987 to 1997 increased 31 percent to 34 acres by 1997. While there are minor walnut acres dispersed throughout the United States, California orchards accounted for 99 percent of all acres and trees. Domestic consumption of English walnuts has declined since the early nineties, but appears to have stabilized in recent years. Exports, however, have increased substantially since 1987, and now account for about half of production. A major destination is the European Union. The industry's change to meet costly requirements for export is a factor that has been driving orchards to become larger and more efficient.

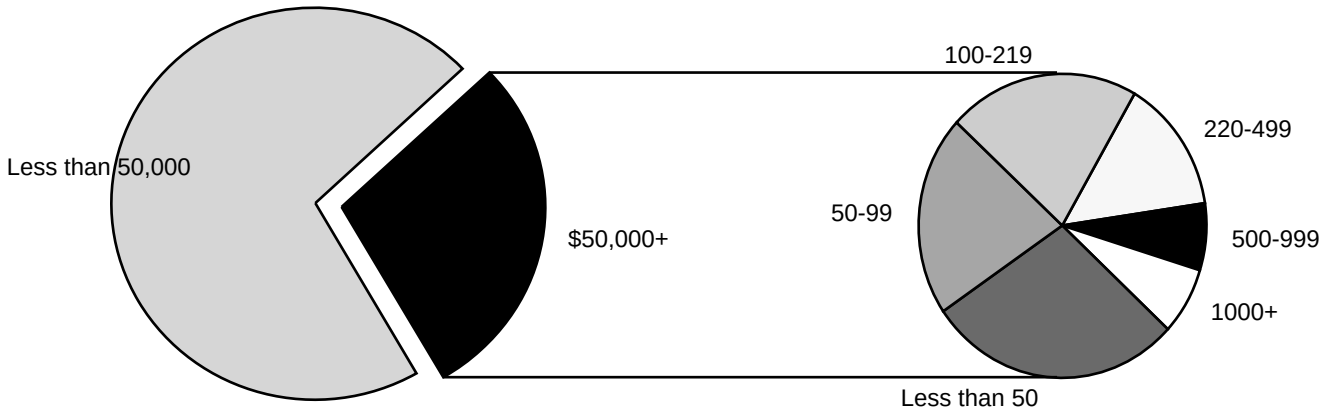
### *Most Farms Still Had Few Acres Planted to Any One Fruit or Tree Nut Crop*

The distribution of farm size for fruit and tree nut production remained roughly unchanged between 1987 and 1997. In 1997, 57 percent of all farms that reported growing fruit and nuts had fewer than 50 acres devoted to any one commodity, virtually the same proportion reported in the 1987 Census of Agriculture. About 14 percent had 50 to 99 acres and another 13 percent had between 100 and 219 acres. About 8 percent had 200 to 499 acres. The proportion of farms with 500 or more acres remained around 7 percent. The distribution of income among farm-size categories, however, did change over this time period. Farms with fewer than 50 acres accounted for 12 percent of revenues in 1987, declining to 9 percent in 1997. The proportion of income received by growers with 50 to 99 acres declined from 11 percent to 8 percent, and growers' share of income with 100 to 219 acres declined from 16 percent to 13 percent during this period. Larger farms, however, increased their share of revenue during this time. Those with 220 to 499 acres increased their share from 16 to 17 percent, and those with 1,000 or more acres increased their share from 45 to 51 percent.

Among farms with sales of $50,000 or more, about 27 percent had less than 50 acres, 21 percent had 50 to 99 acres, 22 percent had 100 to 219 acres, 15 percent had 220 to 499, and 15 percent had 500 or more in 1997 (fig. A-2). The share of farms in the 1 to 50 acres category increased from 1987, declined slightly for those with 50 to 219 acres, and remained unchanged for farms with 220 to 499 acres, and 500 and more acres. While fruit and tree nut revenues increased for all farm sizes with sales of $50,000 or more, farms with fewer than 220 acres received a smaller share of total revenue in 1997 than in 1987 (table A-3). The share of the total revenue going to farms with 220 or more acres, however, increased in 1997 over the previous 10 years. Growers having 220 to 499 acres received a slightly higher share of total revenue from fruit and tree nut sales, and those with 500 or more acres increased their share of total revenues by 3 percentage points to earn about 53 percent. Larger growers have the advantage

Figure A-2

**Share of acres for farms with sales of $50,000 or more, 1997**




Source: Bureau of the Census.

Table A-3--Sales by size of farms, 1987-97

| Farm size | Sales | | | Share of revenue | | |
|---|---|---|---|---|---|---|
| | 1987 | 1992 | 1997 | 1987 | 1992 | 1997 |
| | | $1,000 | | | Percent | |
| Under 50 acres | 868,971 | 994,122 | 1,159,167 | 12 | 11 | 9 |
| 50-99 | 741,835 | 893,433 | 1,069,748 | 10 | 10 | 8 |
| 100-219 | 1,152,761 | 1,431,009 | 1,773,920 | 16 | 16 | 14 |
| 220-499 | 1,119,603 | 1,528,491 | 2,196,143 | 16 | 17 | 17 |
| 500 + | 3,200,848 | 4,353,013 | 6,461,283 | 45 | 47 | 51 |
| 1,000-1,999 | 704,302 | 1,006,740 | 1,519,839 | 10 | 11 | 12 |
| 2,000 + | 1,589,190 | 2,128,966 | 3,256,518 | 22 | 23 | 26 |
| Total | 7,084,018 | 9,200,069 | 12,660,262 | 100 | 100 | 100 |
| Farms with sales of $50,000 + | | | | | | |
| Under 50 acres | 405,382 | 572,094 | 761,719 | 6 | 7 | 6 |
| 50-99 | 638,591 | 806,972 | 991,117 | 10 | 9 | 8 |
| 100-219 | 1,077,548 | 1,368,302 | 1,719,704 | 17 | 16 | 14 |
| 220-499 | 1,081,641 | 1,496,123 | 2,166,612 | 17 | 17 | 18 |
| 500 + | 3,167,585 | 4,322,705 | 6,433,172 | 50 | 50 | 53 |
| 1,000-1,999 | 695,790 | 998,595 | 1,511,919 | 11 | 12 | 13 |
| 2,000 + | 1,582,442 | 2,122,679 | 3,250,029 | 25 | 25 | 27 |
| Total | 6,370,747 | 8,566,197 | 12,072,325 | 100 | 100 | 100 |

Sources: Bureau of the Census, and Economic Research Service, USDA.

of producing larger quantities of a commodity that can be stored over extended periods of time (when applicable) and can therefore have the opportunity to spread out their marketing and receive higher prices during periods of reduced supply. They also can market their commodities in broader geographic areas than smaller growers, often receiving higher prices for higher quality shipped produce. Larger growers also are better able to meet costly, strict requirements set by export-destined countries, both in their growing and packinghouse operations. In States with numerous small farms, it would be difficult for growers to meet strict production requirements or to maintain packinghouses that could meet various export standards.

Florida had the greatest share of large acreage devoted to a single fruit or nut crop among the top five fruit and tree nut States. The top five States in 1997 were: California, Florida, Washington, Texas, and Georgia. In Florida, 2 percent of farms had 1,000 or more acres planted to fruit and tree nuts, for a total of 184 farms in 1997. California had 295 farms in that category, accounting for less than 1 percent of its farms (table A-4). The remainder of the top five States each had

Table A-4--Farms with land in orchards: Top five States, by acres, 1997

| Acres | California | | Florida | | Texas | | Washington | | Georgia | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Farms | Share of farms 1/ | Farms | Share of farms 1/ | Farms | Share of farms 1/ | Farms | Share of farms 1/ | Farms | Share of farms 1/ |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Total | 38,747 | 100.0 | 9,379 | 100.0 | 8,804 | 100.0 | 5,700 | 100.0 | 3,541 | 100.0 |
| 0.1 -0 .9 | 1,223 | 3.2 | 203 | 2.2 | 309 | 3.5 | 243 | 4.3 | 103 | 2.9 |
| 1 - 4.9 | 9,832 | 25.4 | 2,097 | 22.4 | 3,217 | 36.5 | 1,291 | 22.6 | 1,128 | 31.9 |
| 5 - 14.9 | 8,058 | 20.8 | 2,557 | 27.3 | 2,721 | 30.9 | 1,230 | 21.6 | 1,131 | 31.9 |
| 15 - 24.9 | 5,105 | 13.2 | 1,213 | 12.9 | 940 | 10.7 | 645 | 11.3 | 413 | 11.7 |
| 25 - 49.9 | 5,369 | 13.9 | 1,293 | 13.8 | 794 | 9.0 | 904 | 15.9 | 330 | 9.3 |
| 50 - 99.9 | 3,932 | 10.1 | 874 | 9.3 | 458 | 5.2 | 695 | 12.2 | 181 | 5.1 |
| 100 - 249.9 | 3,225 | 8.3 | 574 | 6.1 | 252 | 2.9 | 486 | 8.5 | 125 | 3.5 |
| 250 - 499.9 | 1,211 | 3.1 | 237 | 2.5 | 67 | 0.8 | 131 | 2.3 | 62 | 1.8 |
| 500 - 749.9 | 339 | 0.9 | 87 | 0.9 | 18 | 0.2 | 33 | 0.6 | 30 | 0.8 |
| 750 - 999.9 | 158 | 0.4 | 60 | 0.6 | 10 | 0.1 | 13 | 0.2 | 11 | 0.3 |
| 1,000 + | 295 | 0.8 | 184 | 2.0 | 18 | 0.2 | 29 | 0.5 | 25 | 0.7 |
| 1,000 - 1,999.9 | 196 | 0.5 | 95 | 1.0 | 12 | 0.1 | 21 | 0.4 | 18 | 0.5 |
| 2,000 - 2,999.9 | 46 | 0.1 | 31 | 0.3 | 4 | 0.0 | 4 | 0.1 | 5 | 0.1 |
| 3,000 - + | 53 | 0.1 | 58 | 0.6 | 2 | 0.0 | 4 | 0.1 | 2 | 0.1 |

1/ Share may not total to 100 due to rounding.

Source: Census of Agriculture, 1997, NASS, USDA.

less than 1 percent of the farms with 1,000 acres or more. While the farms with greatest acreage accounted for increasingly greater shares of production and revenue, most farms still had less than 15 acres planted to fruit and nuts.

Many of the farms that grow fruit and tree nuts also have other agricultural enterprises. Some may grow more than one kind of fruit or tree nut and others may grow vegetables, field crops, or even raise livestock. As a result, many farms are larger than the acreage reported for fruit and tree nuts. Accounting for all their agricultural enterprises, most farms still had less than 50 acres. The percentage over 1,000 acres, however, increased to 4 percent, with about 2 percent having 2,000 or more acres. Three percent of California's farms that grew fruit and tree nuts as well as other commodities, and 5 percent of Florida's farms, fit this category. In Georgia and Texas, the share of larger farms increased greatly when other commodities were included. In Georgia, 12 percent of the farms had 1,000 or more acres in 1997, in Texas, 9 percent of farms had 1,000 or more acres.

### *Family-Run Farms Continued To Dominate Production*

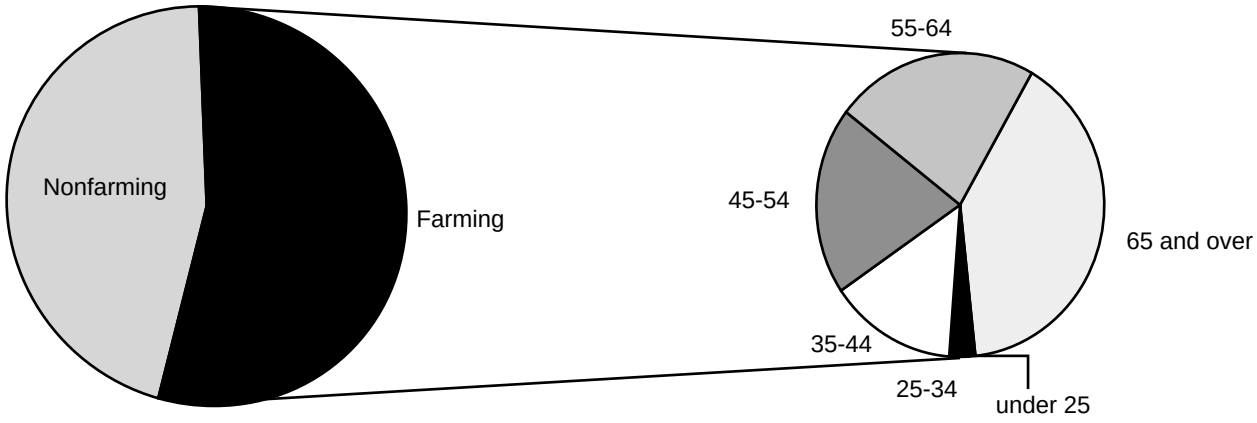
The majority of U.S. fruit and tree nut farms are still family or individually run. In 1997, 77 percent of the farms were family or individually run, down 14 percent from 1987. The next most common form of organization was the partnership, accounting for 12 percent of the farms, 12 percent fewer than 10 years previous. Corporate farming grew during this period by 14 percent to account for 9 percent of fruit and tree nut farms in 1997. Family-held corporations with 10 or fewer stockholders were the most common kind of corporation. Non-family held corporations with 10 or fewer stockholders, however, increased at a greater rate than family-held enterprises over the 10-year period. The category including cooperatives, estates or trusts, institutional organizations, and other types of organizations accounted for a very small portion of farms. This category, however, was the fastest growing form of farm organization between 1987 and 1997. This category, especially cooperatives, could increase in importance among fruit and tree nut farms in the coming years. With the increase in the share of revenues going to the largest farms and the consolidation of the retail industry, small farms may find it advantagous to join cooperatives to best market their products.

Compared with small farms, fruit and tree nut farms with sales of at least $50,000 showed an even stronger presence of corporate organization. In 1997, 21 percent of the farms fell in this category, up from 20 percent in 1987. Family-held organizations with 10 or fewer stockholders were still the most frequent form of corporation. Most of the farms, however, were family or individually run, making up 55 percent of the total in 1997, 4 percent less than in 1987. The share of total revenue was fairly evenly distributed between family or individually run farms, partnerships, and family-held corporations. Only partnership organizations experienced an increase in the share of total revenue between 1987 and 1997, each of the other major categories' share of the total declined.

Tenancy patterns remained stable over the 10 years examined. Most farms were run by full-time farmers. Although two-thirds of the farms, with sales of $50,000 or more, were run by full-time farmers, this group had the largest proportion of tenant farmers. Even with the larger share, tenant farms only comprised 9 percent of all farms in 1997. Orchards require years of commitment before a crop is even marketable, and the trees stay productive for many years,

Figure A-3

**Age by principal occupation of fruit and tree nut growers, 1997**




Source: Bureau of the Census.

making fruit and tree nut farming less likely to have tenant-run farms.

Over half the farmers producing fruit and tree nuts considered farming their principal occupation. This group accounted for 83 percent of the revenue earned. Within this group, more than a third of the farmers were 65 years old and over (fig. A-3). They accounted for about a quarter of the revenue. Another fifth of the farmers were 55 to 64 years of age, with another quarter of the earnings. With almost two-thirds of the farmers 55 and over, the next 10 years could be expected to see a big change in the way fruit and tree nuts are produced. As these farmers retire, the trend towards larger farms that can more efficiently compete in a world market, as well as corporate farming, whether as a means of disbursing the farming obligations to numerous family members or selling to other family or non-family corporations, will likely continue and at a faster pace.

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